Remarks

This application has been carefully reviewed in light of the Office Action mailed May 23, 2008. By this amendment, Applicants have amended claim 39, canceled claims 20-27 and 30-37, and added claims 44-50. No new matter has been introduced by these amendments. Claim 39-50 are pending. Applicants do not admit that these amendments were necessary as the result of any cited art. Applicants respectfully request reconsideration of the above application in view of the following remarks.

The following comments made by the Examiner are not understood/understandable:

> "[t]he most recent final final rejection (October 5, 2007) relied, in part, on Turner and Karappana, which both disclose detecting the presence of a short circuit condition in the architecture. . . While applicant's remarks are directed towards the alleged short-comings of Frey [*sic*], applicants have not responded to or rebutted to the limitation of Turner [*sic*] or Karappana (claims 1-19 were cancelled instead [.]"
>
> (*See*, Non-Final Office Action mailed May 23, 2008, pp. 2, §2, lls. 3-10)

A Response under 37 C.F.R. §1.111 was filed on January 2, 2008 which addressed the deficiencies of *Turner et al.* and *Karupanna et al* (see pp 8-12). The Examiner mailed Final Office Action on February 6, 2008 and applied only the teachings of *Frey et al.* to claims 20-21, 28-31, and 38-39 (of which claims 20, 30, and 39 are independent claims). The Examiner further applied the teachings of *Frey et al.* and *Turner et al.* to dependent claims 22-27 and 32-37. The Examiner failed to apply any such teachings of *Karupanna et al.* to the claims in the Final Office Action of February 6, 2008. Applicants filed a response under 37 C.F.R. §1.111 on May 6, 2008 which identify the deficiencies of *Frey et al.* with respect to independent claims 20,30, and 39. Claims 22-27 and 32-37 are believed allowable in view of the their dependency on independent claims 20, 30, and 39 as well as their own patentable limitations. Applicants respectfully request that the Examiner provide the authority which requires Applicants to respond to references not applied to pending claims in an Office Action.

INFORMATION DISCLOSURE STATEMENT

Applicants submit herewith EP0337155 in an IDS which includes an Abstract in the English language thereby obviating the Examiner's request to provide a concise explanation of the relevance of EP0337155 under 37 C.F.R. §1.56(c).

Applicants also submit in an IDS, EP 1357390 which is believed to be an English translation of Spanish Application P200003143. Applicants clarify the IDS mailed on May 15,2008. In particular, EP 1332924 is not an equivalent to Spanish Patent Application P200003143 as originally stated in the IDS of May 15, 2008. Instead, EP 1332924 is believed to be an English translation of (or equivalent to) PCT ES00/00393.

Further, Applicants submit U.S. Patent 5,159,257 for consideration instead of U.S. Patent 159,257. U.S. Patent 159, 257 was inadvertently submitted. Appropriate correction has been provided with the IDS submitted herewith.

Claim Rejections - 35 U.S.C. § 103(a)

Claims 20-27, 30-32, 34-37, and 39-43 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Frey et al.* U.S. Patent No. 6,232,674 in view of *Turner et al.* U.S. Patent No. 6,646,845. Applicants respectfully request reconsideration of this rejection because the proposed combination of *Frey et al.* and *Turner et al.* fails to demonstrate that the pending claims 39-49 are known in the art.

M.P.E.P. § 2143 provides:

> [t]he rationale to support a conclusion that the claim would have been obvious is **that all the claimed elements were known in the prior art** and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art. *KSR International Co. v. Teleflex*, . . . 82 USPQ2d 1385, 1395 (2007); *Sakraida v. AG Pro, Inc.*, 425 U.S. 273, 282, 189 USPQ 449, 453

> (1976); *Anderson's-Black Rock, Inc. v. Pavement Salvage Co.*, 396 U.S. 57, 62-63, 163 USPQ 673, 675 (1969); *Great Atlantic & P. Tea Co. v. Supermarket Equipment Corp.*, 340 U.S. 147, 152, 87 USPQ 303, 306 (1950). "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." . . . 82 USPQ2d at 1396. **If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art.**
>
> (Emphasis added.)

The proposed combination of *Frey et al.* and *Turner et al.* fails to teach, suggest or disclose features of claim 39 which recites, *inter alia*, "measuring a load impedance of the at least one load prior to reconnecting the at least one load; and comparing the measured load impedance of the at least one load to a predetermined impedance range prior to reconnecting the at least one load to prevent damage to the at least one load in the event the measured impedance is not equal to a value within the predetermined impedance range."

The Examiner concedes that "Frey [*sic*] does not expressly disclose the module SMM determines the presence of a short circuit condition in the architecture" (see, Non Final Office Action mailed May 23, 2008, pg. 4, last paragraph).

Turner et al. fails to cure the deficiencies of *Frey et al.* The Examiner relies on the following passage of *Turner et al.* to support the assertion that *Turner et al.* teaches the presently claimed measuring a load impedance of the at least one load prior to reconnecting the at least one load (Non Final Office Action mailed May 23, 2008, pg. 7, last paragraph):

> FIG. 7 illustrates a subsystem 60 of the battery protection system. **The transparent reconnect subsystem is based upon detection of a transient change to the DC level on the vehicle load. When the FET switches are in the off position, as discussed above, a trickle current flows from the battery through a resistor, with an exemplary value of 6000 ohms. As can be seen on FIG. 1, this resistor is electrically across the drain to**

> **source terminals of the FETs of array 14.** When an operator opens the door, presses the brake pedal or turns on the ignition key, these actions create a transient change to the DC voltage level across the vehicle load. This is true even though the voltage across the vehicle load is considerably lower than the battery voltage, due to the presence of the 6000-ohm resistor in series between the battery and the vehicle load. Transparent reconnect subsystem comprises an amplifier 62 and a comparator 64. The time constant of capacitor 66 and resistor 68 allows the comparator to discriminate the transient changes in the DC level at the junction of the vehicle load from normal electrical noise. This transient is amplified by operational amplifier U2C 24 and coupled to comparator 64. The values of amplification and comparator set levels are predetermined so that the comparator produces a reset pulse that is coupled to an interrupt/reset input 70 of the microprocessor 26. As discussed above, depressing the brake pedal, for example, will create a transient on the vehicle load during those times the FET switches are open that is detected by the reconnect subsystem. If the battery protection system is operating in a mode whereby the FET switches are on, the microprocessor is programmed to ignore the pulses generated by the transparent reconnect subsystem.
>
> (See, *Turner et al.*, col. 9, ll. 9-22, emphasis added)

As exhibited above, *Turner et al.* fails to teach, suggest, or disclose that any such impedance values are measured. At best, *Turner et al.* provides a resistor having a constant resistance of 6000 Ohms. There are no impedance measurements recorded or otherwise obtained. Further, as noted in the above passage, the resistor of *Turner et al.* is used with a transparent reconnect subsystem. *Turner et al.* explicitly provides that the transparent reconnect subsystem is used in connection with a low battery condition (see col. 4, ll. 62-65). The transparent reconnect subsystem of *Turner et al.* has nothing to do with short circuit detection.

Applicants request that the Examiner address the limitations of claim 39. For example, the Examiner has failed to address the claim limitation of "comparing the measured load impedance of the at least one load to a predetermined impedance range prior to reconnecting the at least one load to prevent damage to the at least one load in the event the measured

impedance is not equal to a value within the predetermined impedance range" in the Non Final Office Action mailed May 23,2008.

The Examiner has not provided the Applicants with the specific grounds for rejection under 35 U.S.C. § 103(a). No reference or analysis can be found in the Final Office Action which applies any such teachings of *Frey et al.* and *Turner et al.*, or the other art of record to the limitation of comparing the measured load impedance of the at least one load to a predetermined impedance range prior to reconnecting the at least one load to prevent damage to the at least one load in the event the measured impedance is not equal to a value within the predetermined impedance range.

The proposed combination of *Frey et al.* and *Turner et al.* is silent regarding a number of the limitations of claim 39. Since the presently claimed measuring a load impedance of the at least one load prior to reconnecting the at least one load; and comparing the measured load impedance of the at least one load to a predetermined impedance range prior to reconnecting the at least one load to prevent damage to the at least one load in the event the measured impedance is not equal to a value within the predetermined impedance range is not known in the art, the Examiner has not provided the rationale to support a conclusion that claim 39 is obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-1396, M.P.E.P § 2143 at 129.

For at least this reason, claim 39 is patentable over the proposed combination of *Frey et al.* and *Turner et al.* Claims 40-49 are patentable for the above reasons as well as their own patentable limitations.

The proposed combination of *Frey et al.* and *Turner et al.* fails to teach, suggest or disclose features of claim 45 which recites, *inter alia*, "the module SMM configured to . . . control the at least one power distribution unit, to disconnect all loads and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first voltage signal exceeding the

first predetermined voltage and the second voltage signal exceeding the second predetermined voltage, wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture."

The Examiner concedes that "Frey [*sic*] does not expressly disclose the module SMM determines the presence of a short circuit condition in the architecture" (see, Non Final Office Action mailed May 23, 2008, pg. 4, last paragraph).

Turner et al. fails to cure the deficiencies of *Frey et al.* *Turner et al.* fails to teach, suggest, or disclose the presently claimed module SMM configured to control the at least one power distribution unit to disconnect all loads and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first voltage signal exceeding the first predetermined voltage and the second voltage signal exceeding the second predetermined voltage.

Turner et al. is limited to the following while performing short circuit detection:

> Another feature of the system is a subsystem that detects a dead short between the positive terminal output across the vehicle load 16 and the negative terminal of the battery 12. **Such a short would create an excessive current through the electronic switches of array 14. The excessive current is detected by a high current detection circuit 31, which instructs microprocessor 26 to open the electronic switches. This action removes the excessive load on the battery 12**.
>
> (See, col. 9, ll. 63 - col. 10, ll. 4, emphasis added)

As exhibited above, *Turner et al.* is limited to measuring current across a positive terminal output of a vehicle load and the negative terminal of the battery 12 to determine a short circuit condition.

Turner et al. fails to take into account any such voltages passed through an output and input of a DC/DC converter that is operably coupled between first and second battery assemblies or voltage measurements across a lower potential battery (e.g., the first battery assembly) to further determine the presence of a short circuit condition. Such deficiencies are apparent as *Turner et al.* fails to provide a DC/DC converter or a second battery assembly having a substantially higher potential than the first battery assembly. Applicant's disagree with the Examiner's assertion that "Applicants' battery assembly is not interpreted to include more than one battery, as there is no support in the specification"(see Non-Final Office Action, mailed May 23, 2008, pp. 5, second full paragraph). Applicants clearly provide first and second battery assemblies in Figure 1 in the specification (e.g., B1 and B2).

While *Frey et al.* provides a DC/DC converter, any such voltage passed therethrough is used to detect **undervoltage conditions** (see col. 2, l. 14-26, emphasis added), not short circuit conditions. Assuming, *arguendo*, that the proposed combination of *Frey et al.* and *Turner et al.* teach the presently claimed measured input current exceeds the predetermined load current via the teachings of *Turner et al.* (a point in which Applicants do not agree with), the proposed combination of *Frey et al.* and *Turner et al.* fails to take into account the presently claimed first and/or second voltage signals at the output/input, respectively, of the DC/DC converter that may exceed the first and/or second predetermined voltage ranges, respectively, for short circuit detection purposes, and the presently claimed voltage across the first battery assembly that may exceed a predefined voltage level for a determination of whether a short circuit condition exists.

Turner et al. makes a short circuit determination based on one condition (i.e., current measurement between positive terminal output of vehicle load 16 and negative terminal of the battery 12), while *Frey et al.* makes no such short circuit determination with voltages at the DC/DC converter. In contrast, claim 45 requires that predefined voltage level, the predetermined load current and the first and/or second predetermined voltages must be exceeded to determine the presence of a short circuit condition and to disconnect load(s) accordingly. One skilled in the art would recognize (in view of the Applicants invention) that such conditions assist

in avoiding the detection of erroneous short circuit conditions (see Applicants Specification (clean copy) submitted May 6, 2008, pg. 4, paragraphs [0016]-[0017]). The limitations of claim 45 also ensure that loads are not unnecessarily disconnected in view of erroneous short circuit conditions. Such unnecessary load disconnects may lead to customer dissatisfaction/warranty issues. The prior art of record fails to recognize such conditions.

Since the presently claimed the module SMM configured to control the at least one power distribution unit to disconnect all loads and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first voltage signal exceeding the first predetermined voltage and the second voltage signal exceeding the second predetermined voltage, wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture is not known in the art, the Examiner has not provided the rationale to support a conclusion that claim 45 is obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-1396, M.P.E.P § 2143 at 129.

For at least this reason, claim 45 is patentable over the proposed combination of *Frey et al.* and *Turner et al*. Claims 46-49 depending from claim 45 are patentable for their own reasons as well as their dependency on claim 45.

Claims 20 and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Frey et al*. U.S. Patent No. 6,232,674 in view of Bosch WO 01/21445. Applicants request reconsideration of this rejection because the proposed combination of *Frey et al.* and Bosch. fails to demonstrate that claims 45-49 are known in the art.

The proposed combination of *Frey et al.* and Bosch fails to teach, suggest or disclose features of claim 45.

The Examiner concedes that "Frey [*sic*] does not expressly disclose the module SMM determines the presence of a short circuit condition in the architecture" (see, Non Final Office Action mailed May 23, 2008, pg. 4, last paragraph).

Bosch fails to cure the deficiencies of *Frey et al*. Bosch fails to teach, suggest or disclose the presently claimed module SMM configured to control the at least one power distribution unit to disconnect all loads and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first voltage signal exceeding the first predetermined voltage and the second voltage signal exceeding the second predetermined voltage, wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture.

Frey et al. makes not such inquiry into to a short circuit analysis with respect to voltages at a DC/DC converter and Bosch fails to provide a predefined voltage level associated with the first battery assembly, a predetermined load current associated with the first battery assembly, and at least one of the first and the second predetermined voltage (associated with an input and output of a DC/DC converter) that must be exceeded to ensure that the module SMM detects a short circuit condition. Claim 45 requires that predefined voltage level, the predetermined load current and the first and/or second predetermined voltages must be exceeded to determine the presence of a short circuit condition and to disconnect load(s) accordingly. One skilled in the art would recognize (in view of the Applicants invention) that such conditions assist in avoiding the detection of erroneous short circuit conditions (see Applicants Specification (clean copy) submitted May 2008, pg. 4, paragraphs [0016]-[0017]). The limitations of claim 45 also ensure that loads are not unnecessarily disconnected in view of erroneous short circuit conditions. Such unnecessary load disconnects may lead to customer dissatisfaction/warranty issues. The prior art of record fails to recognize such conditions.

Since the presently claimed the module SMM configured to control the at least one power distribution unit, to disconnect all loads and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first voltage signal exceeds the first predetermined voltage and the second voltage signal exceeds the second predetermined voltage, wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture is not known in the art, the Examiner has not provided the rationale to support a conclusion that claim 45 is obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-1396, M.P.E.P § 2143 at 129.

For at least this reason, claim 45 is patentable over the proposed combination of *Frey et al.* and Bosch. Claims 46-49 depending from claim 45 are patentable for their own reasons as well as their dependency on claim 45.

Claims 20 and 30 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over *Frey et al.* U.S. Patent No. 6,232,674 in view of *Karuppana et al.* U.S. Patent No. 6,465,908 Applicants request reconsideration of this rejection because the proposed combination of *Frey et al.* and *Karuppana et al.* fails to demonstrate that claims 45-50 is known in the art.

The proposed combination of *Frey et al.* and *Karuppana et al.* fails to teach, suggest or disclose features of claim 45.

The Examiner concedes that "Frey [*sic*] does not expressly disclose the module SMM determines the presence of a short circuit condition in the architecture" (see, Non Final Office Action mailed May 23, 2008, pg. 4, last paragraph).

Karuppana et al. fails to cure the deficiencies of *Frey et al.* *Karuppana et al.* fails to teach, suggest or disclose the presently claimed module SMM configured to control the at least one power distribution unit to disconnect all loads and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first voltage signal exceeding the first predetermined voltage and the second voltage signal exceeding the second predetermined voltage, wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture.

Frey et al. makes no such inquiry into a short circuit analysis with respect to voltages at a DC/DC converter and *Karuppana et al.* fails to provide a predefined voltage level associated with the first battery, a predetermined load current associated with the first battery assembly, and at least one of the first and the second predetermined voltage (associated with an output and input of a DC/DC converter) that must be exceeded to ensure that the module SMM detects a short circuit condition. Claim 45 requires that predefined voltage level, the predetermined load current and the first and/or second predetermined voltages must be exceeded to determine the presence of a short circuit condition and to disconnect load(s) accordingly. One skilled in the art would recognize (in view of the Applicants invention) that such conditions assist in avoiding the detection of erroneous short circuit conditions (see Applicants Specification (clean copy) submitted May , 2008, pg. 4, paragraphs [0016]-[0017]). The limitations of claim 45 also ensure that loads are not unnecessarily disconnected in view of erroneous short circuit conditions. Such unnecessary load disconnects may lead to customer dissatisfaction/warranty issues. The prior art of record fails to recognize such conditions.

Since the presently claimed the module SMM configured to control the at least one power distribution unit, to disconnect the at least one load and to determine that a short circuit condition exists within the architecture in response to the module SMM determining that

the measured voltage exceeds the predefined voltage level, the measured input current exceeds the predetermined load current, and at least one of the first voltage signal exceeding the first predetermined voltage and the second voltage signal exceeding the second predetermined voltage, wherein the predefined voltage level, the predetermined load current, and at least one of the first and the second predetermined voltages are parameters that are to be exceeded to ensure that the module SMM avoids detecting the presence of an erroneous short detection within the architecture is not known in the art, the Examiner has not provided the rationale to support a conclusion that claim 45 is obvious. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-1396, M.P.E.P § 2143 at 129.

For at least this reason, claim 45 is patentable over the proposed combination of *Frey et al.* and *Karuppana et al* . Claims 46-49 depending from claim 45 are patentable for their own reasons as well as their dependency on claim 45.

Conclusion

Applicants do not acquiesce in the Examiner's characterizations of the art. For brevity and to advance prosecution, Applicants may not have addressed all characterizations of the art and reserve the right to do so in further prosecution of this or a subsequent application. The absence of an explicit response by Applicants to any of the Examiner's positions does not constitute a concession to the Examiner's positions. The fact that Applicants' comments have focused on particular arguments does not constitute a concession that there are not other arguments for patentability of the claims. Applicants submit that all of the dependent claims are patentable for at least the reasons given with respect to the claims on which they depend.

For the foregoing reasons, Applicants believe that the Office Action mailed May 23, 2008 has been fully responded to. Consequently, in view of the above amendments and remarks, Applicants respectfully submit that the application is in condition for allowance, for which allowance is respectfully requested.

If the Examiner believes a telephone interview would advance prosecution of the application in any manner, the Examiner is invited to contact Martin J. Sultana, representative of Applicants, at the Examiner's convenience at (248) 358-4400.

Please charge any fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

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